



## Evaluation of Comparison of Success Rate of Dental Implants and Post & Core Restorations

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### KEYWORDS

dental implants, post & core, post fracture, peri-implantitis, complications.

### ABSTRACT:

**Background:** This study was conducted for the evaluation of comparison of success rate of dental implants and post & core restorations.

**Material and methods:** This study comprised of 100 subjects having more than 2/3rd crown structure lost in anterior tooth region. The subjects were divided into two groups based on the treatment. Group 1 consisted of individuals who underwent post and core restorations. The second group comprised of subjects who were treated with dental implants. Both groups consisted of 50 subjects each. Statistical analysis was performed using SPSS software.

**Results:** Total 8 out of 50 cases of post and core restorations failed. Hence, the success rate of post and core restorations was 84%. Total 3 out of 50 cases of implants failed. Hence, the success rate of dental implants was 94%.

**Conclusion:** It was concluded that dental implants had a higher success rate (94%) than post and core restorations (86%) for replacement of a damaged tooth.

### INTRODUCTION

Dental implants have been widely used in recent decades to treat edentulous areas or replace extracted teeth.<sup>1,2</sup> Overall, the global market for dental implants was valued at \$4.12 billion in 2021, with over 9 million implants placed. With excellent success rates reported, implant therapy is considered a predictable, safe, and reliable rehabilitation method for edentulous patients in most clinical scenarios.<sup>3-5</sup> However, there is a growing trend of increase in the indications for implants, attributable to their clinical success and/or their popularity.<sup>6</sup>

Root canal therapy is indicated when there is extensive loss or destruction of tooth structure or irreversible pulpitis. The therapy is performed either to remove the source of infection, provide a means for reconstruction of the coronal component of the tooth, or both.<sup>7,8</sup> Depending on the amount of remaining coronal tooth structure, a post may be necessary to allow the tooth crown to withstand the intraoral forces during normal function.<sup>9</sup> In the decision process of whether to restore a tooth with a post prior to definitive restoration, the extent of hard-tissue destruction and the number of remaining axial cavity walls plays a critical



role.<sup>10</sup> However, laboratory and clinical studies have failed to provide evidence that a post may strengthen endodontically treated teeth or enhance their survival.<sup>11</sup> Thus, the primary purpose of post placement is to retain the core material.

Hence, this study was conducted for the evaluation of comparison of success rate of dental implants and post & core restorations for replacing a damaged tooth.

## MATERIAL AND METHODS

This study comprised of 100 subjects having more than 2/3<sup>rd</sup> crown structure lost in anterior tooth region. The subjects were divided into two groups based on the treatment. Group 1 consisted of individuals who underwent post and core restorations. The second group comprised of subjects who were treated with dental implants. In subjects undergoing implant treatment, the remaining teeth were extracted prior to beginning of the procedure. Both groups consisted of 50 subjects each. Statistical analysis was performed using SPSS software.

## RESULTS

**Table 1: Gender-wise distribution of subjects.**

Gender	Number of subjects in group 1 (Post and core)	Number of subjects in group 2 (Dental implants)	Total
Males	35	25	60
Females	15	25	40
Total	50	50	100

There were total 60 males and 40 females in this study.

**Table 2: Complications of dental implants**

Complications	Number of subjects
Peri-implantitis	02
Implant mobility	00
Infection	00
Nerve damage	01
Total	03

It was observed that 2 out of 50 subjects undergoing implant treatment acquired peri-implantitis while 1 subject showed nerve damage.

**Table 3: Complications of post and core**

Complications	Number of subjects
Gingivitis	05
Loss of retention	02
Post fracture	01
Total	08

It was observed that 5 out of 50 subjects undergoing post and core restorations showed gingivitis after the treatment while loss of retention and fracture of the post was seen in 2 and 1 subjects, respectively.

**Table 4: Success rate of both the treatment modalities.**

Fate of procedures	Post and core restorations (n)	Dental implants (n)
Success	42 (86%)	47 (94%)
Failure	08 (14%)	03 (06%)
Total	50 (100%)	50 (100%)

Total 8 out of 50 cases of post and core restorations failed. Hence, the success rate of post and core restorations was 84%. Total 3 out of 50 cases of implants failed. Hence, the success rate of dental implants was 94%.



**Figure 1: Dental implant procedure Figure 2: Post and core procedure**



## DISCUSSION

A dental implant is one of the treatments to replace missing teeth. Around 600 AD, the Mayan population used pieces of shells as implants to replace mandibular teeth. In 1809, J. Maggiolo inserted a gold implant tube into a fresh extraction site. In 1930, the Strock brothers used Vitallium screws to replace missing teeth. A post-type endosseous implant was developed by Formiggini (the father of modern implantology) and Zepponi in the 1940s. The subperiosteal implant was developed in the 1940s by Dahl in Sweden. In 1946 Strock designed a two-stage screw implant that was inserted without a permucosal post. The abutment post and individual crown were added after this implant completely healed. The desired implant interface at this time was described as ankylosis. In 1967, Dr. Linkow introduced blade implants, now recognized as endosseous implants. Dental implants became a scientific cornerstone after the serendipitous invention of Dr. Branemark who helped in the evolution of the concept of osseointegration (direct, rigid attachment of the implant to the bone without any intervening tissue in between two implants)<sup>12-14</sup>

Modern dentistry should follow an evidence-based approach. However, the question of retention or extraction of a tooth has not been satisfactorily answered at a high level of evidence.<sup>15</sup> The decision-making process between tooth retention and extraction is difficult to investigate. A tooth may be functioning; however, multi-factorial risks may lead to extraction upon endodontic or restorative treatment attempts.<sup>16</sup> This is complicated by countless natural or pathological variations, different treatment planning options, a clinician's attitude and/or skillfulness, and

patient preferences. Altogether, limitations in study design become apparent.

The term 'survival' never entered endodontic outcome assessment until implants arrived. Essentially, the resolution of apical periodontitis, together with asymptomatic responses, is considered endodontic success.<sup>16</sup> For implants, osseointegration of an implant, with or without peri-implantitis, or loss of bone is considered survival, not success. Thus, comparing implants and endodontically treated teeth on the basis of endodontic outcome is a difficult endeavor.

Hence, this study was conducted for the evaluation of comparison of success rate of dental implants and post & core restorations for replacing a damaged tooth.

In this study, total 8 out of 50 cases of post and core restorations failed. Hence, the success rate of post and core restorations was 84%. Total 3 out of 50 cases of implants failed. Hence, the success rate of dental implants was 94%.

Implant studies frequently reported outcome rates exceeding 95%. Meta-analyses found success rates of 96.7% to 97.5% for single-unit restorations and 92.5% to 93.6% for fixed partial restorations over 6 to 7 years (Lindh et al., 1998).<sup>17</sup> A large-scale study described cumulative survival rates of 92% for 13,049 two-stage implants over 15 years and 85% for 5,515 one-stage surgery implants over 10 years, including early failures (Boioli et al., 2001).<sup>18</sup>

A systematic review and meta-analysis of primary endodontic treatment found cumulative success rates of 68% to 85% for the decades between 1950 and 2000, ranging from 69.6% to 81.4% for teeth with and 82.1% to 90.1% without apical radiolucency (Ng et al., 2007).<sup>19</sup> However, many datasets derived from treatments by pre-doctoral students who lacked



experience. Some studies had only 6-month follow-ups. Short-term follow-ups may not reflect true endodontic outcomes. Endodontic healing may take up to 4 years and even later long-term healing has been reported (Molven et al., 2002).<sup>20</sup>

## CONCLUSION

It was concluded that dental implants had a higher success rate (94%) than post and core restorations (86%) for replacement of a damaged tooth.

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